Dietary supplementation with *Aloe ferox* extracts reverses obesity in rats

N.R.S. Sibuyi [a,d], D.R. Katerere [b], T. Boboyi [c], A.M. Madiehe [a]
[a] *Diabetes Research Group, MRC, South Africa*
[b] *PROMEC Unit, PO Box 19070, Tygerberg 7505, Cape Town, South Africa*
[c] *Eastern Cape Development Corporation (ECDC), PO Box 80, Queenstown 5320, South Africa*
[d] *University of Limpopo, Turfloop Campus, Private Bag X1106, Sovenga 0727, South Africa*

Aloe ferox Miller, commonly known as the Cape Aloe is an endemic succulent plant native to South Africa and Lesotho. It has been used for both medicinal and cosmetic purposes e.g. wound healing, as a laxative and for the treatment of STIs. More recent pharmacological studies have shown aloe extracts to possess anti-tumour, anti-microbial, anti-inflammatory and anti-diabetic activity. Because of its reputed anti-diabetic activity, we decided to investigate its effect on obesity, the most important risk factor for Type 2 diabetes. Obesity is a multifactorial disease caused by gene and environmental interaction and imbalance in energy intake and expenditure. It is a risk factor for debilitating chronic diseases such as diabetes and cardiovascular diseases. This study investigated the antiobesity effect of diet-supplemented *Aloe ferox* extracts in rats. Male Wistar rats were made obese by feeding a high fat diet, then assigned to three groups ($n=6$ each): the HF-C, the HF-NS1 and HF-NS2 groups fed the HF diet, HF plus NS1 or NS2 aloe extracts, respectively. The NS2 extract significantly reduced body weight, fat pads and liver weight, and blood glucose levels compared to the control and HF-NS1. Although NS1 significantly lost body weight, paradoxically tissue weights and glucose levels were not significantly different from control rats. This data suggests that the NS2 extract has both antiobesity and antidiabetic properties. Further studies are needed to understand the mechanism by which NS2 induces weight loss in HF diet-induced obese rats.

doi:10.1016/j.sajb.2007.02.183

Developmental processes associated with indirect organogenesis in a *Eucalyptus grandis*×*urophylla*

P.G. Simelane [a], M.P. Watt [b], N. Edwards [c], D.J. Mycock [a]
[a] *School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Private Bag 3, WITS 2050, South Africa*
[b] *School of Biological and Conservation Sciences, University of KwaZulu-Natal, Howard College, Durban 4041, South Africa*
[c] *Mondi Business Paper, Trahar Technology Centre, Hilton, South Africa*

The South African Forestry industry forms an essential part of the economy of the country. *Eucalyptus* species are mainly planted in low altitude areas of KwaZulu-Natal and Mpumalanga and are used for timber, pulp and paper production, poles and firewood Members of the genus are also used commercially for the production of essential oils and tannins which are extracted from leaves. The industry invests considerable effort in research towards increased plantation yields and, as a result, micropropagation approaches are now routinely used to support clonal programmes. *In vitro* conservation is presently an active area of research and this study established the successful use of organogenic callus in cryopreservation of the germplasm. An indirect organogenesis technique developed in our laboratories was used to produce propagules of a *Eucalyptus grandis*× *Eucalyptus urophylla*. Assessment of developmental processes in this material focused mainly on identifying callus origin, the vascular connection between callus and shoots and the shoot–root junction. The histological development over a two month period will be described. Identification of the cells that are responsible for initiation and differentiation of callus can also assist in determining the appropriate micropropagatory developmental stages for cryostorage. Using this approach it was established that 52–55% of callus (22 days old) that was prepared for cryostorage by drying to a water content of 49–56%, exposed to cryoprotectants (Dimethyl Sulphoxide and Sucrose) and then slowly frozen (±1 °C per minute) was viable after thawing. Collectively the data add to our growing understanding of the biological processes underlying both micropropagation and cryopreservation of *Eucalyptus*.

doi:10.1016/j.sajb.2007.02.184

Use of the temporary immersion RITA® bioreactor system for micropropagation of sugarcane

S.J. Snyman [a], G.M. Meyer [a], J.R. Richards [a], S. Ramgareeb [a], M. Banasiak [a,b], B. Huckett [a,b]
[a] *South African Sugarcane Research Institute, Private Bag X02, Mount Edgecombe 4300, South Africa*
[b] *School of Biological and Conservation Sciences, University of KwaZulu-Natal, Howard College, Durban 4041, South Africa*

Preliminary studies at the South African Sugarcane Research Institute have shown the potential of the RITA® temporary immersion bioreactor system to increase plant yields significantly when compared to semi-solid media. Consequently, this approach was chosen to investigate micropropagation of sugarcane. To optimise the RITA® system for production of plants via somatic embryogenesis from immature leaf roll explants, 2,4-dichlorophenoxyacetic acid (2,4-D) concentration (0.3 or 0.6 mg/L), flushing interval (3, 6 and 12 h) and integrity of explant used (cut versus whole leaf roll discs) were investigated in cultivar 88H0019. Embryo production on a fresh mass basis was significantly higher when explants were immersed for 1 min every 6 h with medium containing 0.6 mg/L 2,4-D. To address microbial contamination problems often associated with liquid culture, PPM™ (2% (v/v)) was added to